UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Ex parte MARC R. MONTMINY

Appeal No. 2005-1283
Application No. 09/515,276

ON BRIEF

ELLIS, MILLS and GREEN, Administrative Patent Judges.

ELLIS, Administrative Patent Judge.

DECISION ON APPEAL

This is an appeal pursuant to 35 U.S.C. § 134 from the examiner's final rejection of claims 1-7, 12 and 17-33.

As a preliminary matter, we note the appellant's statement on page 8 of the Brief, that the claims do not stand or fall together. 37 C.F.R. § 1.192(c)(7)(2004). According to the appellant, there are three groups; Group I consisting of claims 1-7, 12 and 17; Group II consisting of claims 18-24 and 33; and Group III consisting of claims 25-32. We have considered the groups as proposed by the appellant even though 37 C.F.R.

§ 1.192(c)(7)(2004) requires the appellant to state why the claims in each group are separately patentable and not merely point out differences in what the claims cover. Here, the appellant has done only the latter.[1] Nevertheless, for purposes of this appeal we will address the issues as they apply to claims 1, 18 and 25 which are representative of the subject matter on appeal. These claims read as follows:

> 1. A method for treating an individual suffering from diabetes mellitus, said method comprising administering an effective amount of a compound which inhibits binding of CREB to CBP.
>
> 18. A method for modulating glucose metabolism in an individual, said method comprising administering an effective amount of a compound which inhibits binding of CREB to CBP.
>
> 25. A method for inhibiting expression of phosphoenolpyruvate carboxykinase (PEPCK) enzyme in an individual, said method comprising administering an effective amount of a compound which inhibits binding of CREB to CBP.

The examiner does not rely on any references in rejecting the claims under 35 U.S.C. § 112, first paragraph, as being based on a specification which fails to provide an adequate written description and an enabling disclosure of the claimed invention.

---

[1] In addition, we point out that the appellant's argument in this regard is inconsistent with the specification, and with the claims within the designated groups. That is, the specification discloses that the method for treating diabetes mellitus (claim 1) modulates glucose metabolism (claim 18) and inhibits the expression of PEPCK (phosphoenolpyruvate carboxykinase) (claim 25). Specification, p. 20, para. 1. Thus, it is not clear what difference, if any, there is between the methods set forth in claims 1, 18, and 25. Moreover, with respect to said groups, we point out that claim 3 (a treatment wherein gluconeogenesis is modulated) and claim 5 (transcription of the glucagon gene is inhibited), for example, should have been placed in Group III with claim 18, and claim 4 (transcription of PEPCK is inhibited) in Group II with claim 25. Thus, the appellant's grouping of the claims appears to indicate that there is no actual difference between the methods set forth in each of the aforementioned groups.

We affirm the former (written description) and, therefore, need not address the latter (enablement).

Background

The background information set forth in the specification briefly describes the expression of cAMP-regulated genes in eucaryotic cells. In this regard, the specification discloses (pages 2-3):

> Many eucaryotic genes are regulated in an inducible, cell type-specific fashion. Genes expressed in response to heat shock, steroid/thyroid hormones, phorbol esters, cyclic adenosine monophosphate (cAMP), growth factors and heavy metal ions are examples of this class. The activity of cells is controlled by external signals that stimulate or inhibit intracellular events. The process by which an external signal is transmitted into and within a cell to elicit an intracellular response is referred to as signal transduction. Signal transduction is generally initiated by the interaction of extracellular factors (or inducer molecules, i.e., growth factors, hormones, adhesion molecules, neurotransmitters, and other mitogens) with receptors at the cell surface. Extracellular signals are transduced to the inner face of the cell membrane, where the cytoplasmic domains of receptor molecules contact intracellular targets. The initial receptor-target interactions stimulate a cascade of additional molecular interactions involving multiple intracellular pathways that disseminate the signal throughout the cell.
>
> ***
>
> Protein-protein interactions are involved in all stages of the intracellular signal transduction process- at the cell membrane, where the signal is initiated in the cytoplasm by receptor recruitment of other cellular proteins, in the cytoplasm where the signals are disseminated to different cellular locations, and in the nucleus where proteins involved in transcriptional control congregate to turn on or turn off gene expression.

To transcribe a gene (synthesize an mRNA transcript) in a eucaryotic cell, RNA polymerase II (RNA pol II) must bind to the promoter region at the 5' end of a structural gene. Thus, prior to the present invention it was known that the activation of gene

transcription in a hormone-activated pathway, for example, begins with the binding of a hormone to a cell-surface receptor which causes an increase in cAMP inside the cell. In turn, cAMP activates the protein kinase A (PK-A) heterotetramer which dissociates into the paired regulatory and catalytic subunits. Mayr,[2] p. 599, col. 2, para. 2 and p. 600, legend to Figure 1. The catalytic subunit migrates into the nucleus of the cell and phosphorylates CREB (cAMP response element binding protein) at Ser 133. Id., see also, the specification, pp. 5-6. Phosphorylated CREB binds the CRE site (cAMP response element) on the promoter. Mayr, para. bridging pp. 601-02. In addition, phosporylated CREB binds the CBP (CREB binding protein). Id. CBP, in turn, associates with RNA pol II and transcription is turned on. Id., p. 600; legend to Figure 1.

According to the specification (page 6), "Antisera against CBP have been found to completely inhibit transcription from a cAMP responsive promoter, but not from constitutively active promoters." The specification discloses (pages 4-5) that

> . . . [I]t has been discovered that CREB binding protein (CBP) cooperates with upstream activators involved in the activation of transcription by signal dependent transcription factors, such as c-Jun (responsive to phorbol ester), serum response factor, and the like. Accordingly, assays employing CBP have been developed for the identification of compounds which disrupt the ability of signal dependent transcription factors to activate transcription. . . . [M]ethods employing compounds which inhibit intracellular signal-induced response pathways have been developed for the treatment of diabetes mellitus.

Specifically, with respect the treatment of diabetes mellitus, the specification states (page 20) that the method comprises:

---

[2] Mayr, B., et al. (Mayr), "Transcriptional Regulation by the Phosphorylation-Dependent Factor CREB," Molecular Cell Biology, vol. 2(8), pp. 599-609 (2001), of record.

> . . . contacting a biological system with an amount of an effective amount of a compound which inhibits binding of CREB to CBP. Such methods ameliorate hyperglycemia associated with diabetes mellitus by modulating gluconeogenesis and/or hyperglucagonemia. Particularly, such methods employ compounds which disrupt the formation of CREB:CBP complexes, thus inhibiting transcription of PEPCK or [the] glucogon [sic, glucagon] gene.

Discussion

Written description

The examiner argues that all three claim groups are directed to "methods of performing a function through [the] administration of any compound that is capable of inhibiting binding between CREB and CREB binding protein (CBP)" and that "[t]he compounds used in the methods are identified [only by] their function of inhibiting CREB/CBP binding." Answer, p. 4. The examiner further argues that the specification does not provide an adequate written description of the claimed genus because there is no correlation between compounds capable of inhibiting the binding of CREB to CRP (i.e., compounds having the claimed function) and the structure of said compounds.

It is well established that the purpose of the written description requirement is to "ensure that the scope of the right to exclude, as set forth in the claims does not overreach the scope of the inventor's contribution to the field as far as described in the patent specification." Reiffin v. Microsoft Corp., 214 F.3d 1342, 1345, 54 USPQ2d 1915, 1917 (Fed. Cir. 2000). To that end, to satisfy the written description requirement, the inventor "must also convey with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of the invention." Vas-Cath, Inc. v. Mahurkar, 935 F.2d 1555, 1563-64, 19 USPQ2d 1111, 1117 (Fed. Cir. 1991). "One

shows that one is 'in possession' of the invention by describing the invention, with all its claimed limitations . . . .") Lockwood v. American Airlines, 107 F.3d 1565, 1572, 41 USPQ2d 1961, 1966 (Fed. Cir. 1997).

We point out that it is not necessary for the specification to describe the claimed invention ipsissimis verbis; all that is required is that it reasonably convey to those skilled in the art that, as of the filing date sought, the inventor was in possession of the claimed invention. Union Oil of California v. Atlantic Richfield Co., 208 F.3d 989, 997, 54 USPQ2d 1227, 1232 (Fed. Cir. 2000); Vas-Cath Inc. v. Mahurkar, 935 F.2d at 1563-64, 19 USPQ2d at 1116-17; In re Gosteli, 872 F.2d 1008,1012, 10 USPQ2d 1614, 1618 (Fed. Cir. 1989); In re Edwards, 568 F.2d 1349, 1351-52,196 USPQ 465, 467 (CCPA 1978).

With respect to the written description of inventions "involving a chemical genus, like a description of a chemical species, 'requires a precise definition, such as by structure, formula, [or] chemical name,' of the claimed subject matter sufficient to distinguish it from other materials." University of California v. Eli Lily and Co., 119 F.3d 1559, 1568, 43 USPQ2d 1398, 1405 (Fed. Cir. 1997), quoting Fiers v. Revel, 984 F.2d 1164, 1171, 25 USPQ2d 1601, 1606 (Fed. Cir. 1993). Moreover, a "functional description can be sufficient only if there is also a structure-function relationship known to those of ordinary skill in the art." In re Wallach, 378 F.3d1330, 335, 71 USPQ2d 1939, 1943 (Fed. Cir 2004); see also, University of Rochester v. G.D. Searle & Co., Inc., 358 F.3d 916, 925,

69 USP2d 1886, 1893 (Fed. Cir. 2004); Enzo Biochem, Inc. v. Gen-Probe Inc., 323 F.3d 956, 964, 63 USPQ2d 1609, 1612-13 (Fed. Cir. 2002).

The appellant argues that "the specification discloses the structure of many inhibitory compounds." Brief, p. 10. The appellant relies on the paragraph bridging pages 15-16 of the specification, as well as the first complete paragraph on page 17, for support. We have considered the referenced sections of the specification but find them unpersuasive for several reasons.

First, we point out that with respect to the written description requirement of § 112, the specification disclosure must demonstrate that the appellant was in possession of the claimed invention which, in the case of representative claim 1, involves a method of treating an individual (which includes humans) having diabetes mellitus, with an effective amount of a compound, wherein said compound inhibits binding of CREB to CBP. We point out that although representative claims 18 and 25 are said to be directed to different methods, these claims recite the same step as claim 1; viz., "administering an effective amount of a compound which inhibits binding of CREB to CBP." Thus, a finding that the specification fails to provide an adequate written description of the only step denominated in representative claim 1 would reasonably apply to claims 18 and 25 as well.

Second, turning to the portions of the specification relied upon by the appellant, we find that the paragraph bridging pages 15 and 16 discloses that "antibodies raised against the binding domain of the protein set forth in SEQ ID NO: 2, antibodies raised

against the binding domain of CBP-like compounds, and the like" . . . "are capable of inhibiting activation of cAMP and mitogen responsive genes, and hence can be identified by the invention assay method." The referenced section of the specification provides further detail as to against which amino acid residues of CBP and CREB antibodies should be raised. Although the appellant urges that the specification "describes antibody compounds that disrupt CREB:CBP interaction" (Brief, p. 10, the penultimate sentence), we find that he [the appellant] is not addressing a limitation present in the claims. That is, the claims are not limited to antibodies which inhibit binding of CREB to CBP.[3] Rather, representative claim 1 (as well as claims 18 and 25)

---

[3] We remind the appellant that it is well established that during prosecution, the pending words in the claims are given their broadest reasonable interpretation in view of the specification (In re Morris, 127 F.3d 1048, 1054, 44 USPQ2d 1023, 1027 (Fed. Cir. 1997); In re Zletz, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989)); and that embodiments appearing in the specification are not read into the claims. Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861, 866-67, 228 USPQ 90, 93 (Fed. Cir. 1985); see also, In re Prater, 415 F.2d 1393, 1404-05, 162 USPQ 541, 550-51 (CCPA 1969) (before an application is granted there is no reason to into the claim limitations of the specification).

In DuPont v. Phillips Petroleum Co., 849 F.2d 1430, 1433, 7 USPQ2d 1129, 1131 (Fed. Cir. 1988) the court held:

> It is entirely proper to use the specification to interpret what the Patentee meant by a word or phrase in the claim. See, e.g., Loctite Corp. v. Ultraseal Ltd., 781 F.2d 861, 867, 228 USPQ 90, 93 (Fed. Cir. 1985). But this is not to be confused with adding an extraneous limitation appearing in the specification, which is improper. By "extraneous," we mean a limitation read into a claim from the specification wholly apart from any need to interpret what the patentee meant by particular words or phrases in the claim. "Where a specification does not require a limitation, that limitation should not be read from the specification into the claims." Speciality Composites v. Cabot Corp., Nos. 87-1456, -1457, slip op. at 11 [6 USPQ 1601 at 1605] (Fed. Cir. April 27, 1988), citing Lemelson v. United States, 752 F.2d 1538, 1551-52, 224 USPQ 526, 534 (Fed. Cir. 1985).

encompasses a genus of compounds which disrupt any step in the entire chain of events involved in cAMP-mediated gene transcription and which result in inhibiting the binding of CREB to CBP. For example, the claimed genus encompasses compounds (antibodies and other small molecules) which (i) block the cell surface receptor responsible for triggering the increase of cellular cAMP (such blockage would prevent CREB from becoming phosphorylated and, therefore, inhibit binding to CBP); (ii) inhibit cAMP from activating protein kinase A (PK-A); (iii) block the catalytic subunit of PK-A from migrating into the nucleus; etc. Thus, we find that the claims encompass a genus comprising an indeterminate number of compounds which are described only by means of their function. As discussed above, the specification must "describe the claimed invention so that one skilled in the art can recognize what is being claimed." University of Rochester v. G.D. Searle & Co., 358 F.3d at 923, quoting Enzo Biochem, Inc. v. Gen-Probe Inc., 323 F.3d at 968. "A description of what a material does, rather than of what it is, usually does not suffice." Id., quoting Reagents of the University of California v. Eli Lilly & Co., Inc., 119 F.3d at 1568.

We recognize that the appellant also relies on the first complete paragraph of page 17 of the specification to support its argument. We find that the referenced section of the specification discloses other polypeptides which are said to be capable of inhibiting the activation of cAMP and mitogen responsive genes. We further find that the

---

Thus, we do not construe representative claims 1, 18 and 25 as being limited to antibodies that disrupt CREB:CBP interaction as urged by the appellant.

disclosed polypeptides are fragments of CBP (e.g., KIX fragments) or CREB (e.g., KID fragments), or mutants thereof. We still further find that the specification states that other polypeptide fragments capable of inhibiting CREB binding to CBP, such as the E1A oncoprotein of adenovirus, are said to be "readily" recognizable by those skilled in the art.

The presence of antibodies specific for the regions of CREB and CBP involved in the binding reaction, as well as polypeptides derived from said regions (or mutations thereof), might inhibit binding of CREB to CBP (in vitro); however, we point out that the claims are not limited to antibodies directed against specific regions of CREB and CBP, or to polypeptides derived from said regions. Rather, as discussed above, the claims are directed to a genus of compounds which are described only in functional terms. In addition, if anything, the disclosure on page 17 of the specification underscores the examiner's position that there is no correlation between the function and structure of the compounds within the scope of the claims. That is, the specification discloses that the adenovirus E1A oncoprotein can also inhibit CREB/CBP binding. The structure or chemical composition of (i) the aforementioned oncoprotein; (ii) antibodies specific for the CREB and CBP binding regions; and (iii) polypeptides derived from the CREB and CBP binding regions are not the same, or even similar. Thus, we agree with the examiner that there is no correlation between the structure of compounds capable of inhibiting binding of CREB to CBP and their function. Accordingly, we find that one

skilled in the art cannot recognize the identity of other compounds within the claimed genus by knowing only their function. University of Rochester v. G.D. Searle & Co., 358 F.3d at 926 ("the inventor cannot lay claim to . . . subject matter unless he can provide a description of the compound sufficient to distinguish infringing compounds from non-infringing compounds, or infringing methods from non-infringing methods").

Third, simply describing the genus of compounds needed to perform the claimed methods by function does not end the problem with respect to the failure of the specification to provide an adequate written description of the invention.[4] As pointed

---

[4] Although we pass on the merits of the enablement rejection, we point out that the present invention encompasses novel methods of treating humans. "[T]o be enabling, the specification of a patent must teach those skilled in the art how to make and use the full scope of the claimed invention without 'undue experimentation.'" PPG Ind., Inc. v. Guardian Ind. Corp., 75 F.3d 1558, 1564, 37 USPQ2d 1618, 1623 (Fed. Cir. 1996); In re Wright, 999 F.2d 1557, 1561, 27 USPQ2d 1510, 1513 (Fed. Cir. 1993); In re Vaeck, 947 F.2d 488, 495-96, 20 USPQ2d 1438, 1444-45 (Fed. Cir. 1991). Here, we do not find that the appellant has established any correlation between the in vitro results disclosed in the specification and the usefulness of the claimed genus of compounds to (i) treat individuals suffering from diabetes mellitus by inhibiting the binding of CREB to CBP (claim 1); (ii) modulate glucose metabolism in individuals (claim 18); and (iii) inhibit the expression of phosphoenolpyruvate decarboxykinase in an individual (claim 25). The claimed method involves the prevention of expression of specific genes in individuals, including humans. Thus, we find that the inhibitory compounds described in the specification; i.e., antibodies to the binding sites of CREB and CBP and polypeptides derived from said regions, must act in the nucleus of specific cells. However, the specification does not disclose the in vivo administration of any compounds within the scope of the claims.

In addition, the inhibitory compounds within the scope of the claim are not gene specific but, rather, involve any cAMP or mitogen-mediated promoter. The specification discloses that the method involves the transcription of genes which are responsive to "growth factors, . . . insulin-like growth factor (IGF-1), erythropoietin (EPO), nerve growth factor (NGF), epidermal growth factor (EGF), platelet-derived growth factor (PDGF), fibroblast growth factor (FGF), transforming growth factor β (TGFβ), interferon, tumor necrosis factor, (TNF), interleukins, granulocyte-macrophage colony-stimulating

out by the examiner, the specification does not disclose what constitutes an "effective amount" of said compounds. In this regard, the appellant relies on page 21 of the specification which states that

> . . . the phrase "effective amount" refers to levels of compounds sufficient to provide circulating concentrations high enough to modulate the expression of genes(s) mediated by members of the steroid/thyroid superfamily of receptors. Such a concentration typically falls in the range of about 10 nM up to 2 μM; with concentrations in the range of about 100 nM up to 500 nM being preferred. Since the activity of different compounds described herein may vary considerably, and since individual subjects may present a wide variation in severity of symptoms, it is up to the practitioner to determine a subject's response to treatment and vary the dosages accordingly.

Here, too, we find that the appellant has not conveyed "with reasonable clarity to those skilled in the art that, as of the filing date sought, he or she was in possession of

---

factor (GM-CSF), G-CSF), prolactin serotonin, angiotension, bombesin, bradykinin, noradrenalin, purtrescine, concanavilin A, various oncogenic agents including tumor viruses, UV radiation, estrogen, progesterone, testosterone, gulcagon, PEPCK and the like." Specification, p. 7. It appears that any cell in which transcription is regulated by any of the aforementioned compounds could also be affected by the administration of a compound which inhibits the binding of CREB to CBP. In this regard, it is unpredictable as to which genes and, therefore, which cellular functions within an individual would be affected by the administration of compounds which inhibit the binding of CREB to CBP. Thus, given the unpredictable nature of the invention and the limited teachings of specification, we find that the appellant is "[t]ossing out the mere germ of an idea" without providing reasonable detail which would have enabled "members of the public to . . . carry out the invention." Genentech Inc. v. Novo Nordisk A/S, 108 F.3d 1361, 1366, 42 USPQ2d 1001, 1005 (Fed. Cir. 1997). Accordingly, had we considered this issue, we would have held that the specification would not have enabled one skilled in the art to make and use the claimed invention without undue experimentation. In re Wands, 858 F.2d 731, 736-37, 8 USPQ2d 1400, 1404 (Fed. Cir. 1988)(Whether making and using the invention would have required undue experimentation is a legal conclusion based on several underlying factual inquiries. These factors include, inter alia, "(1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art, and (8) the breadth of the claims").

the invention." Vas-Cath Inc. v. Mahurkar, 935 F.2d at 1563-64. In this regard, we point out that the "effective" amounts disclosed in the specification are solution concentrations normally used in referring to the concentrations of compounds in in vitro culture media. That is, cells in tissue culture are provided with media containing various molar concentrations of a compound (number of moles of solute per liter of solution). Molarity defines the concentration of a solution; whereas, dosages given to individuals are expressed in terms of grams (e.g., mg) per kilogram of body weight. The specification provides no (i) working examples of administering any compound within the scope of the claims to an individual having diabetes mellitus; or (ii) description of an effective amount of said compounds to administer to said individuals. Accordingly, we find that the specification disclosure does not convey to those skilled in the art that the appellant was in possession of the claimed method at the time the application was filed. Vas-Cath Inc. v. Mahurkar, 935 F.2d at 1563-64.

Moreover, assuming arguendo, that the specification disclosure describes an "effective amount" of a compound which inhibits binding of CREB to CBP, we point out that the appellant has argued that there are three groups of claims directed to three different methods. Brief, p. 8. To the extent that the methods may be different, given the claim construction, that difference must lie in the "effective amount" of compound which is administered. The specification does not describe how much of the claimed compounds constitutes an "effective amount" for the methods described in each of representative claims 1, 18 and 25.

As a final matter, we disagree with the appellant's argument that because the specification discloses a method of isolating compounds which are capable of inhibiting the binding of CREB to CBP that it provides an adequate written description of the compounds themselves. Brief, p. 10. Although the specification disclosure of antibodies against, and polypeptides derived from, the binding regions of CREB and CBP, provides an adequate written description of these compounds, it does not describe, and therefore it does not demonstrate that the appellant was in possession of, the full scope of the invention.

Accordingly, in view of the foregoing, Rejection I is affirmed.

Enablement

Having found that the claims are unpatentable as being based on specification which fails to satisfy the written description of 35 U.S.C. § 112, first paragraph, we need not find the claims further unpatentable for failing to comply with the enablement requirement of the same.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 CFR § 1.136(a)(1)(iv)(effective September 13, 2004; 69 Fed. Reg. 49960 (August 12, 2004); 1286 Off. Gaz. Pat. Office 21 (September 7, 2004)).

AFFIRMED

JOAN ELLIS
Administrative Patent Judge

DEMETRA J. MILLS
Administrative Patent Judge

LORA GREEN
Administrative Patent Judge

) BOARD OF PATENT
) APPEALS AND
) INTERFERENCES

JE:hh

Appeal No. 2005-1283
Application No. 09/515,276

FOLEY & LARDNER
P.O. BOX 80278
SAN DIEGO, CA 92138-0278